Cloud computing
To support your business objectives

Breaking through the haze: understanding and leveraging cloud computing.

Intelligence explosion demands a new computing model

A new, intelligent planet is developing around us — one that enables us to move, interact and conduct business more rapidly than ever before. In a world where almost anyone and anything can connect to the Internet, we are seeing an explosion of technology and information — and connected devices — affecting our everyday lives. With all the added convenience this intelligence explosion has wrought, it has also introduced new levels of complexity. For instance:

- Organizations are facing accelerating business change, global competitive pressures and social responsibility demands.
- IT delivery has grown more challenging due to technology changes, increasing end-user sophistication and rapid information growth.
- Users accessing services via Internet technologies expect a secure, “always-on” computing infrastructure that delivers as easily and reliably as electricity from a wall outlet, requiring a fundamental change in how services are delivered.

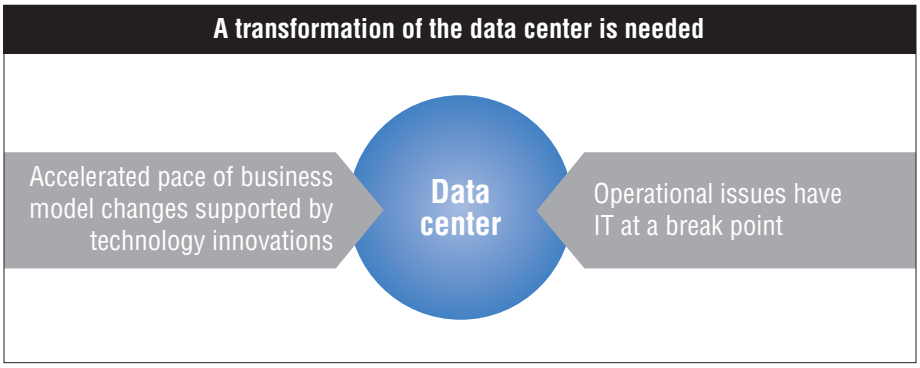
Organizations are striving to reach their full potential by rapidly implementing innovative business models while lowering IT barriers to innovation and change. Accomplishing these goals calls for a new, dynamic computing model that enables rapid innovation for applications, services and service delivery.

Rapid service delivery and "anywhere, anytime access" characterize clouds

Cloud computing provides a means of delivering computing services that makes the underlying technology, beyond the user device, almost invisible. And because it allows applications and services to be uncoupled from the underlying infrastructure, enabling the business to adjust quickly to change, cloud computing can be part of a strategy to create a more dynamic enterprise.

Cloud computing can also enhance initiatives for implementing service oriented architecture (SOA), data center optimization and information management. Its fundamental tie to service management will help drive lower cost of ownership, improved security, higher service quality and service "elasticity" to meet demand. In addition, as more IT resources are added, a cloud-based infrastructure can reduce incremental labor costs to nearly zero.

The focus on the user experience is also a huge part of the excitement and benefit of cloud computing. A simplified user interface and SOA foundation make clouds the delivery model with the "anywhere, anytime, just the way I want it" promise. Cloud computing makes sense for many businesses, but it's important to understand the types of clouds that are available and which is most desirable, given your business goals.



Unravel the cloud confusion — public versus private

Most of what is publicized about cloud computing focuses on the concept of public clouds, which are characterized as being available via an outside service provider. Public clouds can provide the ability to scale rapidly with minimal up-front cost[1] and offer an infrastructure that meets needs for rapid innovation. They also enable end users to access computing resources (applications, storage, processing power, data) when they are needed and for as long as they are needed, in an attractive, pay-for-what-you-use model. Some service providers offer applications targeted for end users, such as e-mail and calendaring. Others offer unique business applications, like providing developers with access to shared development platforms with high resource scalability, to create and enhance applications.

The other model of cloud computing, called a "private" cloud-based service, offers many of the benefits of a public cloud computing environment. The difference is that in a private cloud-based service, data and processes are managed within the organization without the restrictions of network bandwidth, security exposures and regulatory compliance concerns that using public cloud services across open, public networks might entail. In addition, private cloud services can offer the provider and the user greater control, improving security and resiliency[2] as user access and the networks are restricted and designated.

Deciding which type of cloud is right for your environment is an important first step in evaluating cloud computing for your company. It's important to understand which workloads are best suited to take advantage of its benefits. And it's important to understand the environment in which those workloads can perform — public or private. We also anticipate the development of various business models that include integrated services from different providers (public and private) to support and drive business innovation and IT optimization.

Work with IBM, a leading provider of private and public cloud technology

IBM has long been on the forefront of developing private and public cloud technology and offering public cloud services, and can provide real-world experience helping organizations implement their own clouds. IBM also has first-hand experience implementing cloud computing centers around the world, including Dublin, Ireland; Beijing, China; Johannesburg, South Africa; Tokyo, Japan; and several other locations.

For the past five years, IBM has hosted "enterprise-class" cloud services for clients via its IBM Computing on Demand (CoD) offering. With global

centers located in the financial hubs of New York, London and Tokyo, IBM is able to service clients that need secure, flexible computing resources on an hourly, weekly or yearly basis. In addition, IBM can meet the essential needs of a business, no matter the size, with cloud services like IBM Arsenal Digital Solutions that provide information protection services, and the IBM pilot program, "Bluehouse," an innovative and powerfully intuitive set of cloud-based business applications.

Examine infrastructure requirements before adopting cloud computing

Unlike other companies, IBM approaches cloud computing from the perspective that you need a trusted foundation on which to build the most secure, efficient and resilient service platform, utilizing cloud computing where appropriate. Other vendors begin with the user interface and largely ignore the importance of the underlying infrastructure.

Is cloud computing right for your organization?

Cloud computing can be beneficial in three key areas:

Business innovation — Cloud computing fosters business innovation by enabling organizations to quickly and cost-effectively explore the potential of new, IT-enabled business enhancements that can grow with unprecedented scale.

Service delivery — Cloud computing enables the dynamic availability of IT applications and infrastructure. More rapid service delivery results from the ability to orchestrate the tasks to create, configure, provision and add computing power in support of IT and business services much more quickly than would be possible with today's computing infrastructure. Enhanced service delivery reinforces efforts for customer retention, faster time to market and horizontal market expansion. Cloud computing can enhance SOA, information management and service management initiatives, which also support your service delivery initiatives.

IT optimization — Cloud computing supports massive scalability. Services can be quickly expanded or contracted without requiring major overhauls to the core data center. The benefits include lower cost of ownership, which drives higher profitability, enabling you to more easily reinvest in your infrastructure and answer the question, "how do I do more with fewer resources?"

A question organizations must ask is, can a cloud infrastructure support our future needs for service delivery and demand? By examining your infrastructure needs, you help ensure that the service environment you build today will stand the test of time.

Review a checklist for cloud computing

For any organization looking to adopt a cloud computing model, following are some key considerations:

Data center maturity — The key is an organization's ability to integrate cloud computing into a broader strategy and architected plan to align IT resources closely with overall business goals, objectives and needs. In some cases, cloud computing may be the answer for receiving and/or delivering services. In other cases, leveraging the underlying technologies may be the most appropriate choice.

SOA — Reusing and sharing components to deliver services is a required part of any effective cloud computing environment. In a cloud, those shared components can be sourced on the Internet, through any provider, and organizations can choose to only pay for the components that they need.

Service management — A fully optimized data center demands a solid service management platform, deployed with industry best practices, that supports business processes, usage tracking for purposes of billing or chargeback, applications and IT infrastructure. Service management is request-driven and can allocate services, dynamically move and optimize workloads and data across the shared infrastructure, and integrate added resources to scale with very little, if any, intervention by cloud service provider personnel.

Information on demand — To achieve the goal of an optimized data center, organizations must be able to provide easy-yet-secure information access. A private cloud supports more secure information access by allowing organizations to access components of information from the cloud and populating it into their servers — all while keeping the service completely transparent to users.

Green IT — The inherently shared environment in a cloud supports resource optimization and virtualization — both of which help cut down on energy usage and associated costs. If greener is your goal, cloud computing can support that.

Web 2.0/social networking — Cloud computing is a service delivery model that supports Web 2.0 by helping organizations design the infrastructure around the end-user experience — including information optimization.

Choose experience and expertise for your cloud computing implementation — choose IBM

IBM leverages a collection of enabling technologies and services to create the cloud computing experience for its customers in data center, service provider and cloud-hosted environments. Organizations working with IBM have the flexibility to establish their own cloud computing centers on premises and within their firewalls, leveraging the benefits of security and resiliency that a private cloud offers.

A leading provider of technology including SOA, information management, service management and security, IBM offers the services, products and solutions to help you create a clear, reliable roadmap toward building and using cloud computing to enhance these areas. The IBM track record for transitioning data centers to new levels of reliability and performance is well documented.

Using a global network of skills and technology expertise, IBM offers a broad range of assessment services and cloud computing solutions. The IBM approach to cloud computing is predicated on real-world experience, offering trusted solutions and expertise to help you use cloud computing to accelerate innovation, connect people and provide an effective and creative service delivery model.

For more information

For more information about implementing cloud computing in your organization, contact your IBM representative or IBM Business Partner, or visit **ibm.com**/cloud or **ibm.com**/cloudcomputing

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[1] The term “public” does not mean free, although some clouds may be free or fairly inexpensive to use.

[2] Some up-front investment is needed to establish a private cloud.

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